About TÜV Rheinland Group

TÜV?

Technischer
Überwachungs-
Verein

Technology
Inspection
Society

Head office: Cologne, Germany
Established in 1872 as a third-party organization for steam boiler inspection
TÜV Rheinland in world wide

20,000 employees in over 60 countries worldwide
Specialists, Auditors, Inspectors, Engineers to respond to the Safety and Security of a wide range of Industries

<table>
<thead>
<tr>
<th>Germany</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 8,795 employees</td>
<td>11,665 employees</td>
</tr>
<tr>
<td>Total 20,450</td>
<td></td>
</tr>
</tbody>
</table>

Japan
6 locations
400 employees

Office
Laboratory

Fukuoka
Osaka
Yokohama
TÜV Rheinland Japan

<table>
<thead>
<tr>
<th>TÜV Rheinland Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
</tr>
<tr>
<td>Established</td>
</tr>
<tr>
<td>Capital</td>
</tr>
<tr>
<td>Number of Employees</td>
</tr>
<tr>
<td>Annual sales</td>
</tr>
</tbody>
</table>

TÜV Rheinland Japan is a member of the TÜV Rheinland Group, an international technical inspection agency. As a third-party testing organization, we have been providing services in Japan since 1978.
TÜV Rheinland Japan Test Facility

Technology Center: GTAC (Yokohama)

Technology Center: KTAC (Osaka)

EMC lab. (Fukuoka)
OpenADR Certification Testing Service
TRJ's domestic Smart Grid related service status

Smart Grid in Japan
Standards for Communications

- PV
- Storage Battery
- Fuel Cell
- EV/PHV
- Air Conditioning
- Lighting
- Water Heater

Resource

- PV
- Storage Battery
- Fuel Cell
- EV charger
- Water Heater

Aggregation Coordinator

Resource Aggregator

Resource Aggregator

Resource Aggregator

HEMS

HAN

Utility / Energy Service Provider

Demand Response System Server

Smart Meter

Route A

Route B

ECHONET Lite / SMA

Wi-SUN

G3-PLC

ECHONET Lite / AIF

Wi-SUN

ZigBee

Wi-Fi

BT

PLC

Ethernet

TRJ can TEST
OpenADR Certification Policy

Certification Policy Summary:
- To establish a certification program to ensure compliance and interoperability
- OpenADR 2.0 certification and testing policies, processes and procedures
- Virtual Top Node (VTN) and Virtual End Node (VEN) concepts
- VTN / VEN test methods and test tools
- OpenADR Logo License
- Profile compatibility
- Role of certification body and testing body
- Accredited Testing Lab
- Mandatory and Option feature
- Concept of certification/testing of the similar/identical products
- Concept of certification/testing of Updated Product

Refer Documents:
- OpenADR 2.0a/b Profile Specification
- OpenADR 2.0 Protocol Implementation Conformance Statement (PICS)
- OpenADR 2.0 Test Specification
- OASIS Energy Interoperation Specification
- OpenADR Certificate Policy
OpenADR  Role of Certification Body and Testing Lab

- “Certification” is performed by the Certification Body (CB) or the OpenADR Alliance. Currently, there is no certification body (CB), and the OpenADR Alliance has all.

- “Testing” is performed by a Testing Lab accredited by the OpenADR Alliance. TRJ is one such accredited Testing Lab.

- CB and Testing Lab comply with ISO17065 and ISO 17025
Requirement of OpenADR certification test

General communication product certification

Conformance Test

Interoperability Test

OpenADR covers only Conformance Test
OpenADR Certification Test Environment

<table>
<thead>
<tr>
<th>VEN Testing</th>
<th>DUT (Device Under Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Harness (by QualityLogic)</td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="Diagram of VEN Testing" /></td>
<td><img src="image2" alt="Diagram of VEN Testing" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VTN Testing</th>
<th>DUT (Device Under Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Harness (by QualityLogic)</td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Diagram of VTN Testing" /></td>
<td><img src="image4" alt="Diagram of VTN Testing" /></td>
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</tbody>
</table>

Note) If you want to perform a certification test in a real environment where the DUT is in the Cloud Server, please consult with Testing Lab.
Fee required for OpenADR Certification

(1) Member Fee
   Pay membership fee as license to OpenADR Alliance

(2) Certification Fee
   Pay the certification fee for the certification process by the OpenADR Alliance

(3) Test Fee
   Pay the testing fee to accredited test lab
OpenADR Alliance Japanese members and certification status

October 2019, 20 Japanese companies, all contributors

<table>
<thead>
<tr>
<th>Certified Member</th>
<th>Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOSHIBA (Leading Innovation)</td>
<td>OMRON (Sensing tomorrow)</td>
</tr>
<tr>
<td>FUJITSU</td>
<td>HITACHI (Inspire the Next)</td>
</tr>
<tr>
<td>NEC Engineering, Ltd.</td>
<td>SUMITOMO ELECTRIC</td>
</tr>
<tr>
<td>MITSUBISHI ELECTRIC (Changes for the Better)</td>
<td>THE NEW VALUE FRONTIER</td>
</tr>
<tr>
<td>azbil (Azbil Corporation)</td>
<td>Fuji Electric</td>
</tr>
<tr>
<td>ENERES</td>
<td>NTT</td>
</tr>
<tr>
<td>AMG SOLUTION</td>
<td>DAIKIN</td>
</tr>
<tr>
<td>NISSIN SYSTEMS</td>
<td>GRID SOLUTIONS</td>
</tr>
<tr>
<td>Oi Electric Co., Ltd. Panasonic</td>
<td>MEIDEN</td>
</tr>
<tr>
<td>ALPHA SYSTEMS INC.</td>
<td></td>
</tr>
</tbody>
</table>

https://products.openadr.org/
TRJ OpenADR Certification Test Service

TRJ always provides certification tests based on the latest test specifications

<table>
<thead>
<tr>
<th>Certification Test</th>
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<tbody>
<tr>
<td>Supported Profile</td>
</tr>
<tr>
<td>Product Roles</td>
</tr>
<tr>
<td>Transports</td>
</tr>
<tr>
<td>Message Exchange Patterns</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-Test Service</th>
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<tbody>
<tr>
<td>• Before the certification test, you can test using the certification test tool</td>
</tr>
<tr>
<td>• You can practice the actual certification test with the test engineer</td>
</tr>
<tr>
<td>• You receive a technical consultation on certification testing</td>
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</tbody>
</table>
Features of TRJ’s OpenADR Certification Test service

- Test in Japan (TÜV Yokohama Test Lab or On-site)
- Witness test
- Pre-test service
- Technical Support on certification test
- Certification Process support with OpenADR Alliance
- Real environment tests such as “Cloud environments”
OpenADR Certification Flow chart

1. **Member Registration**
2. **Download Spec / Test Spec / PICS**
3. **Request of TEST**
   - fill-in PICS
4. **Receive Test Report**
5. **Submission Certification Documents**
   - fill-in DoC
6. **Certified**
7. **Test Plan**
8. **Certification Test**
   - Pre-Test by hope
9. **Create Test Report**
10. **Certification Work**
11. **Issuance Certificate**

**Applicant**
## Documents required for OpenADR certification

<table>
<thead>
<tr>
<th>for Test</th>
<th>for Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>❑ Submit to : Testing Lab (TRJ)</td>
<td>❑ Submit to : OpenADR Alliance</td>
</tr>
<tr>
<td>❑ Documents:</td>
<td>❑ Documents:</td>
</tr>
<tr>
<td>1) OpenADR Test Application Form</td>
<td>1) Declaration of Conformity</td>
</tr>
<tr>
<td>📌 Fill in Applicant information and Product information</td>
<td>📌 Fill in Applicant information and Product information</td>
</tr>
<tr>
<td>2) PICS (Protocol Implementation Conformance Statement)</td>
<td>2) Test Report</td>
</tr>
<tr>
<td>📌 Fill in the application details required for the certification test</td>
<td>📌 Test Report delivered from TRJ</td>
</tr>
<tr>
<td>📌 TRJ creates a test plan based on PICS</td>
<td>3) PICS (Protocol Implementation Conformance Statement)</td>
</tr>
<tr>
<td>📌 PICS submitted to TRJ for testing</td>
<td></td>
</tr>
</tbody>
</table>

©TÜV Rheinland Japan Ltd.
OpenADR Certification Test Location and Contact Information

TUV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku,
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Tel : (+81) 45-470-1850

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